

analysis of eight populations of *Mesodon zaletus*, ranging from n.e. West Virginia to s.w. Missouri, shows ca 1.3 alleles per locus, general conformation to Hardy-Weinberg equilibrium, and a Nei similarity of 0.8 to 1.0 among populations. A complete analysis of electrophoretic data is in progress.

SYSTEMATIC RELATIONSHIPS OF THE *ORTHALICUS* OF FLORIDA. Jane E. Diesler, Florida State Museum, Gainesville.

The gross anatomy of *Orthalicus floridensis* Pilsbry and *O. reses* (Say) was examined to establish a basis for determining the status of *O. reses nesodryas* Pilsbry. The genital anatomy and shell pigmentation were found to define two species of *Orthalicus* in Florida, *O. floridensis* and *O. reses*. Shell pigmentation and geographic distribution separate *O. reses* s.s. from *O. r. nesodryas*. *O. r. nesodryas* is therefore maintained as a subspecies.

The results of covariance analysis of quantitative shell traits were compared to the dendrogram produced by cluster analysis of these traits for the Florida taxa and *O. undatus jamaicensis* Pilsbry. Covariance analysis separates these taxa in a manner consistent with soft anatomy. However, the dendrogram indicates that the degree of overlap is such that quantitative shell traits are not sufficiently reliable to separate these species of *Orthalicus*.

HISTOLOGY AND ULTRASTRUCTURE OF THE VAS DEFERENS IN SELECTED TERRESTRIAL PULMONATES. Richard L. Reeder, Faculty of Natural Sciences, University of Tulsa, Oklahoma.

The vas deferens was examined in two species of Helminthoglyptidae (*Monadenia fidelis* and *Sonorella virilis*) and five species of Polygyridae (*Ashmunella chiricahuana*, *Mesodon elevatus*, *M. zaletus*, *Triodopsis albolabris*, and *T. fosteri*). In *S. virilis* and *A. chiricahuana* the duct is uniform throughout its length. In *S. virilis* the duct is muscular with a tall columnar epithelium lining the lumen. Uniform microvilli can be demonstrated with the TEM. In *A. chiricahuana* the duct is lined with tall, pale, columnar cells and is moderately muscular. In *M. fidelis* the portion of the vas deferens joining the free oviduct is slightly enlarged while in both species of *Triodopsis* and *Mesodon* the duct is abruptly enlarged at the junction. In all of these latter five species, the lumen of the enlarged portion is thrown into large, numerous folds appearing somewhat like villi in cross section. The lumina of the ducts in these animals is lined with a tall columnar epithelium with at least two cell types apparent in *M. fidelis* and *T. fosteri* (*T. albolabris* and the species of *Mesodon* have not been examined for cell type as yet). In *M. fidelis* there are pale goblet-like cells scattered through the columnar epithelial cells. Examination with the TEM indicates microvilli are numerous. In *T. fosteri* some of the cells have microvilli and some have both cilia and microvilli in the enlarged portion of the duct while only microvilli could be demonstrated in the rest of the duct. The epithelium in *M. fidelis*, *T. fosteri* and *S. virilis* appears to be of the transporting type.

RADIOCENTRUM AVALONENSE IS ALIVE AND WELL ? ON CATALINA ISLAND. F. G. Hochberg, Barry Roth, Santa Barbara Museum of Natural History, California, and Walter B. Miller, Department of General Biology, University of Arizona, Tucson.

In 1902 Henry Hemphill discovered an unusual oreohelcid snail on Santa Catalina Island, California. The specific name, *avalonense*, suggests that the snail was originally collected in the vicinity of the town of Avalon. However, in spite of repeated attempts the snail could not be found again and was reported to be extinct. In 1982 a small population of live snails was located about 2½ miles south and west of Avalon. Extensive surveys have failed to turn up the snail in other areas on the island, hence, we conclude that it is restricted to the southeastern tip of the island. Here it occurs only on steep, sparsely vegetated, south-facing slopes dominated by Black Sage (*Salvia mellifera*) and Prickly Pear Cactus (*Opuntia littoralis*). The small, sluggish snail lives deep in talus piles and emerges only in wet weather to feed on *Salvia*.

Conchologically the species is typical of the family Oreohelicidae. The shell is lens-shaped and distinctly carinate. At maximum size the shell diameter is 14 mm and there are 5½ whorls. The radially ribbed embryonic shell is diagnostic of the genus *Radiocentrum*. However, until live specimens were discovered generic placement could not be verified. Specimens from Catalina Island were found to have a reproductive system identical to the oviparous genus *Radiocentrum*. In addition to the large albumen gland, swollen lower third of the spermathecal duct and much enlarged, hatchet-shaped upper penis characteristic of the genus, *R. avalonense* is further defined by a distinctly swollen lower penis with three conspicuous longitudinal ridges.

The genus *Radiocentrum* was once widely distributed throughout western North America. Climatic changes have dramatically restricted the range of the genus. The distribution of Quarternary taxa has been further reduced and fragmented by the imprint of the Sonoran and Chihuahuan deserts. The majority of the species in the genus are relicts which persist in small isolated localities. Typical of such relicts only a few scattered, low density colonies of *R. avalonense* have been found on Catalina Island. Several related species in Texas and Mexico are known only from empty shells indicating the continued extinction of outlying populations. As an outlier, *R. avalonense* lives a precarious existence under less than optimal conditions. Considered potentially vulnerable to extinction, protective status is warranted for this rare, insular endemic.

ARE EUGLANDINA AND GONAXIS EFFECTIVE AGENTS FOR BIOLOGICAL CONTROL OF THE GIANT AFRICAN SNAIL IN HAWAII? Carl C. Christensen, Division of Malacology, Bernice P. Bishop Museum, Honolulu, Hawaii.

Frequent assertions have been made that the predatory snails *Euglandina rosea*, *Gonaxis kibweziensis*, and *G. quadrilateralis* have been demonstrated to be effective agents for the control of the giant African snail, *Achatina*

fulica. Few of these statements have been based upon experimental evidence from systematically conducted field observations, however, and field studies conducted in Hawaii that have been cited in support of such claims do not adequately consider factors other than predation (particularly disease, parasitism, and reproductive seasonality) that may account for observations of decline in abundance of *Achatina* populations or that may influence the age distribution of those populations. As it has long been known that the abundance of *Achatina* in a particular locality may decline drastically in the absence of introduced predators, a finding that African snails became reduced in numbers following the introduction of predators does not prove the effectiveness of

these predators as control agents unless a cause and effect relationship can be demonstrated between predation and the observed reduction in the abundance of *Achatina*. No compelling evidence has yet been presented that *Euglandina* and *Gonaxis* do in fact exert a meaningful level of control of pest snail populations in Hawaii. As the effectiveness of these predators as biological control agents is unproven, public health and agricultural authorities contemplating their introduction to additional Pacific Islands cannot assume that such introductions will yield health or economic benefits to offset the significant environmental costs that are likely to be associated with the establishment of these predators in fragile island ecosystems.